

BEFORE THE
Federal Communications Commission
WASHINGTON, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)
)
Improving Public Safety)
Communications in the 800 MHz Band)
)
Consolidating the 900 MHz Industrial/)
Land Transportation and Business Pool)
Channels)

WT Docket No. 02-55

To: The Commission

COMMENTS OF DELMARVA POWER & LIGHT COMPANY
AND ATLANTIC CITY ELECTRIC COMPANY

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Dated: May 6, 2002

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EXECUTIVE SUMMARY

Delmarva Power & Light Company and Atlantic City Electric Company, licensees of 800 MHz radio systems used to support their electric and gas utility operations, agree that Public Safety licensees should operate without the risk of harmful interference. However, before imposing a disruptive and costly band realignment, the FCC must conduct a thorough study of the causes and extent of Public Safety interference to determine whether realignment would actually resolve these problems. Such a study is particularly important because preliminary reports indicate that realignment would not eliminate certain types of interference, such as intermodulation. Because of the potentially widespread impact of the realignment alternative, the FCC should attempt to resolve any interference complaints through less-intrusive technical or market-based solutions.

To avoid a devastating effect on incumbent licensees in the 800 MHz band, the FCC should explore technical solutions to harmful interference suffered by Public Safety systems. Because interference mitigation is ultimately the responsibility of the parties causing and receiving the interference, the FCC should permit these parties to resolve their interference problems on a case-by-case basis. Industry reports have already indicated that interference is highly localized and have identified a number of technical solutions, such as altering antenna configurations, replacing combiners, and modifying signal strength. In addition, the FCC could establish rules to promote the resolution of Public Safety interference through negotiation and arbitration, with firm timelines for ensuring prompt elimination of interference. This market-based approach would provide an efficient and effective solution to interference problems without unnecessarily involving other licensees.

The FCC should not realign the 800 MHz band because it would severely disrupt incumbent operations, impairing the ability of utilities to maintain and protect their critical electric and gas infrastructure, even though they neither cause nor receive interference. If the FCC ultimately determines that realignment is the least costly and disruptive solution to Public Safety interference, then it should adopt rules to provide innocent 800 MHz licensees with comparable and adequate replacement spectrum and require the cost-causer to reimburse all of their relocation expenses.

The proposed realignment plans are unacceptable approaches to Public Safety interference resolution because they would not comply with these well-established relocation principles. The Nextel proposal would require every licensee in the band to relocate but fails to provide an adequate funding mechanism, thus forcing innocent licensees to bear their own costs of relocation. The Nextel proposal would also relocate licensees to inadequate and unavailable spectrum even as Nextel, the primary source of interference, would receive highly valued spectrum in the 2 GHz band.

The NAM and FCC proposals also lack adequate assurances of funding, provide no details on the transition to replacement spectrum, and impose substantial costs and unnecessary disruption on incumbent licensees. The FCC proposal also fails to account for General Category and NPSPAC licensees. Because of these deficiencies, the Nextel, NAM, and FCC proposals are completely inadequate approaches to resolving Public Safety interference.

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Delmarva Power & Light Company ("Delmarva") and Atlantic City Electric Company ("Atlantic"), through their undersigned telecommunications counsel, submit these Comments on the *Notice of Proposed Rule Making* in the above-captioned matter pursuant to Section 1.415 of the Federal Communications Commission's ("FCC" or "Commission") rules.¹ The FCC initiated this proceeding to investigate harmful interference to Public Safety licensees. Delmarva and Atlantic share the FCC's concern about interference to Public Safety land mobile systems and support solutions to resolve these problems with minimal cost and disruption to all potentially affected parties.

¹ In re Improving Public Safety Communications in the 800 MHz Band; Consolidating the 900 MHz Industrial/Land Transportation and Business Pool Channels; WT Docket No. 02-55, *Notice of Proposed Rule Making*, 17 F.C.C. Rcd. 4873 (2002) [hereinafter *NPRM*]. The *NPRM* was published in the Federal Register on April 5, 2002. 67 Fed. Reg. 16351 (Apr. 5, 2002).

I. BACKGROUND AND INTRODUCTION

In the *NPRM*, the FCC asserts that numerous Public Safety licensees have reported harmful interference to their 800 MHz land mobile radio systems in recent years.² To identify the extent and source of this interference, the FCC created the Commercial/Public Safety Interference Task Force in April 2000, comprised of representatives of Public Safety licensees, cellular carriers, Nextel, and Motorola. In November 2000, the Task Force published a set of thirty-six survey responses, generally indicating that Public Safety users have experienced higher than expected levels of interference in the immediate vicinity (*e.g.*, within 3/4 mile) of certain cell sites at which Nextel and/or cellular carriers have 800 MHz transmitting equipment.³ To combat this interference problem, the Task Force issued a *Best Practices Guide* to provide a broad overview on methods of identifying and alleviating interference in December 2000.⁴

On November 21, 2001, Nextel Communications, Inc. ("Nextel") filed a proposal with the FCC, which it claimed would reduce interference to 800 MHz Public Safety radio systems. In this *White Paper*, Nextel admitted that it was principally responsible for the interference problem but, nevertheless, proposed that the FCC: (1) assign it 10 MHz of additional, contiguous spectrum in the 2 GHz band for its own operations; (2) remove Business and Industrial/Land Transportation ("I/LT") systems from the 800 MHz band; (3) realign the 800 MHz channel plan; (4) reallocate additional spectrum to Public Safety licensees; and (5) require

² *NPRM*, 17 F.C.C. Rcd. 4873 ¶ 14.

³ Public Safety Wireless Network, Special Assignment Technical Report: 800 MHz Interference Survey Response (Nov. 2000).

⁴ Avoiding Interference between Public Safety Wireless Communications Systems and Commercial Wireless Communications Systems at 800 MHz: A Best Practices Guide (Dec. 2000) [hereinafter *Best Practices Guide*].

all non-Public Safety users of the 800 MHz band to reimburse Public Safety's relocation costs, including Business and I/LT licensees that do not interfere with Public Safety operations.⁵

In response to this anecdotal information regarding Public Safety interference, the FCC initiated the present rulemaking to investigate solutions to the problem. Delmarva and Atlantic support the FCC's goal of promptly eliminating the cause(s) of Public Safety interference. As explained below, Delmarva and Atlantic rely on their private land mobile radio systems to support critical utility operations affecting virtually every resident and business in their operating territories and frequently interact with Public Safety agencies. Because of Delmarva and Atlantic's reliance on private land mobile radio to protect life, health, and property, the FCC must ensure that the mechanisms used to resolve Public Safety interference do not adversely affect utilities.

Delmarva and Atlantic are sister utility companies that collectively provide electric service to the Delmarva Peninsula in the Mid-Atlantic as well as parts of New Jersey and gas service in New Castle County, Delaware. Together, these regional utilities serve over one million electric and gas customers in Maryland, Delaware, Virginia, and New Jersey.

To facilitate their internal communications, and to monitor their power generation and distribution systems, Delmarva and Atlantic operate extensive private land mobile communications systems using 800 MHz licenses. Delmarva holds eight 800 MHz trunked licenses, including a temporary base station license, consisting of 52 discrete frequencies from the Industrial/Land Transportation, Business, and Public Safety Pools. Delmarva operates 27

⁵ Nextel Communications, Inc., Promoting Public Safety Communications – Realigning the 800 MHz Land Mobile Radio Band to Rectify Commercial Mobile Radio – Public Safety Interference and Allocate Additional Spectrum to Meet Critical Public Safety Needs 9, 15-16 (Nov. 21, 2001) [hereinafter *Nextel White Paper*].

mobile relay stations and 44 control stations throughout the states of Maryland, Delaware, and Virginia. In conjunction with these stations, Delmarva currently employs approximately 938 mobile units on its 800 MHz system and provides service to third party customers who use an additional 595 mobile units. Atlantic holds three 800 MHz trunked licenses, consisting of 7 discrete frequencies from the Industrial/Land Transportation and Business Pools. Atlantic operates 9 mobile relay stations and 12 control stations in New Jersey and has loaded 690 mobile units onto its 800 MHz system.

These wireless communications systems support Delmarva and Atlantic's utility operations. Delmarva, Atlantic, and other power utilities provide the core resources – gas and electricity – that permit modern society to function. Because industrial, business, and domestic operations depend on the availability of electric and gas power, Delmarva and Atlantic's utility services impact the lives of virtually everyone within their service territories. In addition to these customers, Delmarva and Atlantic are also responsible for providing electricity and gas to hospitals, government, airports, public safety, and other critical facilities throughout their service territories. Simultaneously, Delmarva and Atlantic must ensure the safety of the work crews maintaining their infrastructure and delivering the electricity and gas safely and efficiently to their customers. Delmarva's and Atlantic's internal communications systems are essential to protect the safety of their employees who must work around high-voltage electric lines. They also permit Delmarva and Atlantic to keep their systems functioning on a 24 hour a day, 7 day a week basis to respond to power outages that could deprive large areas and populations of electricity and gas services. Thus, while safety is a concern for all 800 MHz licensees, power utilities and other critical infrastructure industries have demonstrably more crucial requirements for reliable, interference-free communications.

Because any realignment of the 800 MHz band, or reallocation of the 2 GHz band, would affect the use of Delmarva and Atlantic's wireless systems, they are vitally interested in the FCC's *NPRM*.

II. LIMITED REPORTS OF PUBLIC SAFETY INTERFERENCE INDICATE THAT FURTHER STUDY IS NECESSARY

Delmarva and Atlantic note that the anecdotal evidence of Public Safety interference reveal little information about the scope and source of the problem.⁶ While Delmarva and Atlantic recognize that Public Safety agencies rely on land mobile communications to support their mission-critical functions, several proposals that have surfaced in the context of this proceeding assume that the problem is much larger than suggested by the evidence, fail to explain adequately how they would actually address Public Safety interference problems, and would have devastating consequences for Delmarva, Atlantic, and other 800 MHz licensees.

Because of the wide-ranging repercussions of the proposals advanced in this proceeding, the FCC must compile significantly more empirical evidence at the outset to define the precise nature and scope of the problem. Without discounting the importance of even isolated incidents of interference to Public Safety systems, Delmarva and Atlantic believe that the FCC could craft a far less drastic approach to safeguard Public Safety communications systems.

A. The FCC Should Conduct an In-Depth Study on the Scope and Source of the Alleged Public Safety Interference Before Imposing a Band-Wide Solution

Before taking any action that would significantly affect an entire band, the FCC typically conducts a thorough study of the band in question. For example, when the FCC proposed to reallocate spectrum to the Emerging Technologies, it directed the Office of Engineering and

⁶ At this time, the Commercial/Public Safety Interference Task Force has received approximately 90 responses to its survey.

Technology ("OET") to research several possible spectrum homes for these operations and for incumbents impacted by such a reallocation.⁷ In addition, to find spectrum suitable for advanced wireless services, the FCC examined several different bands, issuing an *Interim Report* in November 2000 and a *Final Report* in March 2001.⁸ Thus, the FCC has repeatedly declined to reallocate spectrum without having the OET carefully investigate the possible repercussions of such an action.

Because of the myriad interests and the potential costs involved, a thorough study is particularly appropriate prior to any realignment of the 800 MHz band. Using empirical evidence obtained through such a study, Delmarva and Atlantic believe the FCC could narrowly tailor a solution to the alleged Public Safety interference problem that would not require a relocation of every licensee on the band. Even considering the limited information that parties have developed so far, the incidents of Public Safety interference appear to involve a variety of technical issues. Thus, significantly more information is necessary to justify the massive changes that Nextel and others have proposed in this proceeding.

B. Industry Reports Offer a Preliminary Assessment of Public Safety Interference Factors

Although Public Safety and Commercial Mobile Radio Service ("CMRS") licensees have shared the 800 MHz band on an interleaved basis since 1982,⁹ the FCC did not receive any

⁷ Office of Engineering and Technology, Creating New Technology Bands for Emerging Telecommunications Technology, FCC/OET TS92-1 (Jan. 1992), *available at* http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=1008300002.

⁸ Office of Engineering and Technology, et al., Spectrum Study of the 2500-2690 MHz Band: The Potential for Accommodating Third Generation Wireless Systems, ET Docket No. 00-258, *Final Report* (rel. Mar. 2001); Office of Engineering and Technology, et al., Spectrum Study of the 2500-2690 MHz Band: The Potential for Accommodating Third Generation Wireless Systems, ET Docket No. 00-232, *Interim Report*, 15 F.C.C. Rcd. 22310 (2000).

⁹ *NPRM*, 17 F.C.C. Rcd. 4873 ¶ 7.

complaints of harmful interference until November 1998.¹⁰ In an effort to determine the scope and source of this interference, industry representatives have released reports analyzing the isolated occurrences of interference. These industry reports indicate that a variety of reasons could explain the occurrence of interference at 800 MHz and that the parties could apply a number of techniques on a case-by-case basis to analyze and resolve these situations.

Despite the limited number of reported incidents, industry representatives have preliminarily ascribed this interference to three factors: (1) differences between system architectures; (2) Public Safety Receivers; and (3) channel adjacencies.

Differences Between System Architectures. As noted in the *NPRM*, analog Public Safety systems typically provide extensive coverage with a single transmitter or a relatively small number of transmitters, using high-site base stations and only minimal frequency reuse.¹¹ Because of this system design, the signal picked up by Public Safety mobile units is apparently strongest when they are near the transmitter and becomes weaker the farther they get from it.¹²

In contrast, Nextel's digital system typically uses many low site base stations to blanket geographical areas with strong signals and employs a high number of frequencies at each site.¹³ Unlike the Public Safety systems, Nextel's use of multiple low-site base stations creates relatively strong signals throughout its service area.¹⁴

¹⁰ Joe Kuran, Timeline of Events Relating to Harmful Interference (Dec. 19, 2001), in APCO, Project 39: Interference to Public Safety 800 MHz Radio Systems, Interim Report to the FCC (Dec. 24, 2001), available at http://www.apco911.org/afc/project_39/interim_report.pdf [hereinafter *Project 39 Interim Report*].

¹¹ *NPRM*, 17 F.C.C. Rcd. 4873 ¶ 11.

¹² *Best Practices Guide*, *supra* note 4, at 6-7.

¹³ *Id.* at 7

¹⁴ *Id.*

According to the *Best Practices Guide*, these different system designs could create a "near-far" problem for licensees in certain situations. When Public Safety mobile units are a significant distance from their base stations (and especially when they are on the fringes of their systems' coverage areas), but are close to a Nextel base station, the relatively weak Public Safety signals must compete with strong Nextel signals.¹⁵ This competition results in the stronger Nextel signals interfering with the weaker Public Safety communications.

Public Safety Receivers. The *Best Practices Guide* also states that interference may occur because Public Safety licensees receive broadly across the 800 MHz band. While this lack of frequency selectivity makes Public Safety receivers more cost effective, giving licensees the flexibility to use a single radio for multiple systems that operate on different frequencies, it exposes a receiver to far more sideband noise, intermodulation products, and receiver overload problems.¹⁶ When Public Safety mobile units operate in areas with high signal levels from low-site digital systems, the open-ended nature of the Public Safety receivers significantly increases the likelihood of interference.¹⁷

Channel Adjacencies. The *Best Practices Guide* also identifies the close proximity of 800 MHz Public Safety channels to CMRS channels as a source of interference.¹⁸ Nevertheless, even though the FCC has permitted 800 MHz Public Safety and CMRS licensees to share the 800 MHz band since 1974, and to operate on interleaved channels since 1982, no significant problems were reported until 1998.¹⁹ Thus, while frequency proximity might contribute to

¹⁵ *Id.* at 6-8; *NPRM*, 17 F.C.C. Rcd. 4873 ¶ 15.

¹⁶ *Best Practices Guide*, *supra* note 4, at 8-9

¹⁷ *Id.* at 7-8.

¹⁸ *Id.*

¹⁹ *Id.* at 6.

Public Safety interference, Delmarva and Atlantic believe that the FCC could resolve this problem through technical solutions and with recent improvements in technology, without realigning the entire band.

III. THE FCC SHOULD EXPLORE TECHNICAL SOLUTIONS TO RESOLVE HARMFUL INTERFERENCE TO PUBLIC SAFETY SYSTEMS

Delmarva and Atlantic believe that the FCC may resolve the Public Safety interference problem through technical solutions. Although Nextel would reap considerable competitive advantages by requiring Business and I/LT users to vacate the 800 MHz band, and Public Safety would no doubt prefer additional spectrum allocations and a funding mechanism for new radio systems, the FCC initiated this proceeding for the limited purpose of resolving allegations of interference between Nextel's low-site digital transmitters and existing Public Safety systems. The injection of additional issues related to Public Safety allocations or Nextel's entitlement to additional spectrum would likely delay the ultimate resolution of the more critical interference issues raised by the Public Safety community. Thus, Delmarva and Atlantic urge the FCC to adopt a well-measured response to the problem at hand.

A. Interference Mitigation Is the Responsibility of the Parties Causing and Receiving the Interference

In the 800 MHz band, resolution of interference problems is the responsibility of the specific licensees causing and receiving the interference. Under Section 90.173(b) of the FCC's rules, "all applicants and licensees shall cooperate in the selection and use of frequencies in order to reduce interference" through mutually satisfactory arrangements.²⁰ If the licensees are unable to reach an agreement, however, the FCC "may impose restrictions[,] including specifying the

²⁰ *Id.* § 90.173(b) (2001). The *Best Practices Guide* also counsels commercial licensees and public safety agencies to collaborate and share responsibility for avoiding interference. *Best Practices Guide*, *supra* note 4, *passim*.

transmitter power, antenna height, or area or hours of operation of the stations concerned."²¹

Section 90.403(e) contains a similar rule on interference mitigation, requiring all licensees to "take reasonable precautions to avoid causing harmful interference."²² As a last resort, the FCC noted that it may relocate the interfering licensee.²³

Thus, in the 800 MHz band, the interfering party has the primary responsibility to prevent the occurrence of harmful interference. If interference does occur, however, the FCC's rules set forth the appropriate order of interference mitigation techniques: (1) mutual agreement between the affected licensees; (2) imposition of technical restrictions on the affected licensees; and (3) relocation of the interfering licensee. Neither Section 90.173(b) nor Section 90.403(e) requires third-party licensees to participate in any interference mitigation.

Nextel's status as the primary source of interference in the 800 MHz band is well documented in reports by Public Safety agencies as well as in anecdotal evidence. For example, in its *Project 39 Interim Report*, APCO found that thirty of the forty-five Public Safety agencies reporting 800 MHz interference identified Nextel as the culprit.²⁴ Although Nextel has publicly

²¹ 47 C.F.R. § 90.173(b). In some instances under Part 90, the FCC has announced that it would employ a "first-in-time" principle under which the last licensee to commence operations would have to resolve any interference. In re Amendment of Parts 2, 22, and 90 of the Commission's Rules to Allocate Spectrum in the 928-941 MHz and to Establish Other Rules, Policies, and Procedures for One-Way Paging Stations in the Domestic Public Land Mobile Service and the Private Land Mobile Radio Services, GEN Docket No. 80-183, RM-2365, RM-3047, RM-3068, *Second Report and Order*, 91 F.C.C.2d 1214, 1223 ¶ 32 (1982).

²² 47 C.F.R. § 90.403(e).

²³ In re Application of American Television of Utah, Inc. Salt Lake City, Utah; For a Television Construction Permit, File No. BPCT-790822KE, *Memorandum Opinion and Order*, 1984 FCC LEXIS 1530, *5 (1984) ("Generally, channel changes are used as a last resort where there is, or a petitioner has established a reasonable likelihood of interference, and where all efforts to filter out such interference fails.").

²⁴ See *Project 39 Interim Report*, *supra* note 10, *passim*.

admitted causing interference in only twelve states,²⁵ a survey conducted by the *Portland Oregonian* found that Public Safety operators in twenty-one states complained that Nextel caused substantial interference to their systems and that operators in five other states suspected that Nextel was their interference source.²⁶ In Phoenix, for example, the city's deputy information technology director stated that Nextel's "towers make our system look like Swiss cheese."²⁷ Overall, out of the twenty-eight states responding to the *Oregonian's* survey, twenty-six pinpointed Nextel as the actual or potential source of the harmful interference.²⁸ The Chief of the Wireless Telecommunications Bureau has also acknowledged that Nextel is the likely cause of the interference to Public Safety licensees in the 800 MHz band.²⁹ Thus, any rules that the FCC adopts in this proceeding should restrict participation in interference mitigation to the parties causing or receiving the interference.

In the *White Paper*, Nextel claims that "[i]ncident-by-incident, after-the-fact interference remediation will inevitably fail to protect fully [Public Safety officials] and fail to keep pace with

²⁵ The *Portland Oregonian* reported that Nextel has conceded to causing interference in Arizona, California, Colorado, Florida, Louisiana, Maryland, New Jersey, New York, North Carolina, Ohio, Oregon, and Washington. Emily Tsao and Ryan Frank, *Emergency Calls Crowded Out the Stage for Problem*, OREGONIAN (Portland), Aug. 5, 2001, at A01.

²⁶ *Id.*

²⁷ Ryan Frank and Emily Tsao, *Nextel Frees Police Airwaves: The Company Reduces Cell-Phone Interference that Blocked Fire and Police Radios in Portland, But Other Cities Still Face Problems*, OREGONIAN (Portland), Jan. 6, 2002, at B01.

²⁸ Since the date of this survey, more than six months ago, new interference problems involving Nextel have arisen in other states, including several complaints from New Jersey public safety agencies. Jacob Quinn Sanders, *Upgrade Near for Emergency Radio System; Montco Will Vote Next Week. Cell-Phone Signals Have Been Hampering Some Transmissions*, PHILA. INQUIRER, Mar. 15, 2002.

²⁹ Allyson Vaughan, *FCC Tackles 800 MHz Interference Problems*, WIRELESS WEEK, Mar. 18, 2002 (citing Tom Sugrue, Chief of the Wireless Bureau, as agreeing that the cause of the interference is "more on the Nextel side").

the evolving communications needs of both Public Safety and commercial communications providers."³⁰ Nextel also contends that relying on technical solutions would result in an "ongoing burden" and "spectral constraints" on commercial carriers, although it describes neither the alleged burden nor constraints in any detail.³¹

Resolution of Public Safety interference does not necessarily require disruption to other licensees in the 800 MHz band. Thus, the FCC should limit the impact of its rules to those entities that cause or experience interference.

B. Industry Reports Have Already Identified a Number of Technical Solutions

Since the CMRS/Public Safety problem first arose in 1998, significant effort has gone into determining technical solutions. The *Best Practices Guide* and Motorola's *Interference Technical Appendix (Issue 1.41)* contain numerous technical solutions that could either alleviate to an acceptable level or even completely eliminate interference in specific situations. The following sections summarize the technical solutions that could resolve specific types of interference.

Intermodulation. In the *Project 39 Interim Report*, APCO reported that intermodulation is the predominant cause of interference to Public Safety entities in the 800 MHz band.³² If intermodulation is the source of the problem, digital system licensees and Public Safety entities could implement several steps that, taken alone, could significantly alleviate or eliminate interference. Equipment that operates outside of its specifications may cause or exacerbate interference. To resolve this problem, Motorola found that a CMRS carrier may simply need to sweep a transmitter's antenna system or check the tuning on the combiners to ensure that they

³⁰ *Nextel White Paper*, *supra* note 5, at 23.

³¹ *Id.* at 24.

³² *Project 39 Interim Report*, *supra* note 10, at 3.

comply with specifications.³³ In addition, a digital CMRS carrier could decrease the power at which it transmits its signal, thus reducing the strength of the intermodulation product and making it less likely to overpower the Public Safety signal.³⁴ Digital CMRS carriers could also attempt to avoid transmitting on frequencies known to result in harmful intermodulation products,³⁵ especially when multiple carriers collocate at a site. Collocated carriers could coordinate their operations to avoid creating harmful intermodulation products.

In addition to these efforts by digital CMRS carriers, Public Safety licensees could take steps to increase their resistance to intermodulation interference dramatically. For example, a Public Safety licensee could increase the strength of its signal, thus making it less susceptible to being overpowered by an intermodulation product.³⁶ Motorola has stated that Public Safety licensees could also use receivers that have intermodulation specifications of 74 dBs or higher, which are much more immune to interference caused by intermodulation than receivers with less than 74 dBs.³⁷ Using receivers that receive a narrow range of frequencies, instead of receivers that lack frequency selectivity and receive much of the 800 MHz band, would decrease the likelihood of intermodulation products dropping into them. Additionally, changing receiver antennas could reduce the antenna gain and thus alleviate intermodulation interference.

Transmitter Sideband Noise. Digital CMRS licensees could undertake several technical solutions to alleviate or eliminate interference caused by transmitter sideband noise.

³³ Motorola, Interference Technical Appendix, Issue 1.41 44 (Feb. 2002), available at http://www.motorola.com/cgiss/docs/Interference_Technical_Appendix.pdf [hereinafter *Interference Technical Appendix*].

³⁴ *Id.*; *Best Practices Guide*, *supra* note 4, at 12.

³⁵ *Interference Technical Appendix*, *supra* note 34, at 44.

³⁶ *Id.*

³⁷ *Id.*

As with intermodulation interference, they could ensure that their equipment operates in accordance with specifications³⁸ and, if necessary, decrease the power at which they transmit their signals.³⁹ They could also undertake modifications of their transmit antennas, such as increasing the center of radiation in order to increase local site isolation.⁴⁰ A similar effort would be to change the antenna in some manner, including changing the antenna pattern or eliminating down-tilt, in order to reduce the signal level in the immediate area of a site.⁴¹ Digital CMRS licensees may also reduce the amount of sideband energy through additional filtering of the transmitter.⁴²

In some situations, digital CMRS carriers could alleviate or eliminate transmitter sideband interference by using cavity combiners instead of hybrid combiners to reduce the amount of sideband energy.⁴³ In fact, Frontier Radio Communications, a company that designs, sells, installs, and services digital wireless communications equipment, recently stated that it "[does] not allow systems with hybrid combining at our sites because they don't protect other users."⁴⁴ Frontier Radio stated that it recently resolved an 800 MHz interference problem caused by Nextel's hybrid combiner at the Las Vegas Convention Center.⁴⁵ In an effort to reduce the

³⁸ *Id.* at 43.

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Best Practices Guide*, *supra* note 4, at 13.

⁴³ *Interference Technical Appendix*, *supra* note 34, at 43-44.

⁴⁴ Roger Combs, *Nextel Interference: A Transmitter-Filtering Issue?*, RADIORESOURCE MAGAZINE, Apr. 2002, at 10 (Letter to the Editor).

⁴⁵ *Id.*

interference, Nextel replaced the hybrid combiner with "a newer type of combiner," which reduced the interference to an acceptable level.⁴⁶

Public Safety licensees, for their part, could alleviate or eliminate transmitter sideband interference by increasing the strength of their signals, thus making them less vulnerable to being overpowered by sideband energy.⁴⁷

In terms of potential regulatory action, the FCC already limits the permissible amount of sideband emissions.⁴⁸ In the *NPRM*, however, it recognized the potential value of tightening those limits, stating its belief that "improvements in the 800 MHz Public Safety band could result if we imposed more stringent limits on the out-of-band emissions of CMRS transmitters potentially affecting satisfactory reception of Public Safety communications."⁴⁹ Because digital systems are the primary source of transmitter sideband interference to Public Safety entities, the FCC should further limit these emissions by CMRS licensees operating digital systems in the 800 MHz band.

Receiver Overload. Although the *Best Practices Guide* reports that receiver overload rarely occurs in modern receivers, digital carriers could alleviate or eliminate interference caused by receiver overload by decreasing the power at which they transmit their signals, thus making the signal less likely to be over-amplified in the Public Safety receiver.⁵⁰ A carrier could also reduce its signal level by virtue of the local antenna pattern by increasing the height of its

⁴⁶ *Id.*

⁴⁷ *Interference Technical Appendix, supra* note 34, at 43.

⁴⁸ 47 C.F.R. § 90.210.

⁴⁹ *NPRM*, 17 F.C.C. Red. 4873 ¶ 75.

⁵⁰ *Best Practices Guide, supra* note 4, at 9, 12.

antenna site, altering its antenna radiation pattern, and utilizing antennas with tighter beam-width.⁵¹

In short, the *Best Practices Guide* and Motorola's *Interference Technical Appendix (Issue 1.41)* have already identified a number of technical solutions to resolve this interference, and the FCC's rules should not mandate or prohibit any particular interference-reducing measures.

C. A Market-Based Approach Would Resolve Interference with the Least Cost and Disruption to Incumbent Licensees

Along with other commenters, Delmarva and Atlantic believe that a market-based system would protect Public Safety from harmful interference, permit flexibility in accommodating disparate radio systems in the 800 MHz band, and minimize, if not eliminate, detrimental impacts on other users of the band. Specifically, the FCC should establish threshold parameters to facilitate the identification of low-site digital facilities that could cause interference to Public Safety systems. The rules should clarify that the interfering licensee has the responsibility to eliminate interference with the cooperation of the licensee receiving interference. To ensure prompt resolution of Public Safety interference, the FCC should establish timeframes during which the potentially interfering licensees must respond to the allegations of interference and the parties must reach a mutually acceptable arrangement. Although the FCC should encourage prompt resolution, it should allow parties to use a range of options to resolve interference, including modifications of equipment and voluntary channel swaps. Finally, if the parties fail to reach a mutually acceptable arrangement, the FCC should adopt procedures requiring third-party arbitration of disputes in order to minimize FCC involvement. Thus, a market-based proposal would enable licensees to resolve their problems cooperatively within a structured environment while not impacting licensees that neither cause nor receive interference.

⁵¹ *Id.* at 12.

IV. THE FCC SHOULD NOT REALIGN THE 800 MHZ BAND

A. Insufficient Evidence Exists to Suggest That Realignment Would Alleviate Intermodulation

The FCC lacks the empirical evidence necessary to mandate a realignment of the bands allocated to Business and I/LT licensees as a solution to the problem of Public Safety interference. As noted above, intermodulation appears to be the chief source of the interference to Public Safety operations.⁵² As the FCC notes in the *NPRM*, however, a significant question exists concerning whether a realignment of the 800 MHz band would remedy this problem.⁵³

Because realignment would cause pervasive disruption and impose substantial monetary and intangible costs, the FCC should not entertain the possibility of realignment unless the record definitively shows that this avenue would adequately remedy interference to Public Safety users and that no other less disruptive approach could be effective in remedying interference. To the extent that the record supports this finding, the FCC should circumscribe the realignment to avoid unnecessarily affecting parties, particularly utility licensees that neither cause nor receive interference. In this regard, the FCC should not reallocate Business, I/LT, or General Category spectrum without compelling proof that reallocation represents the best means of addressing Public Safety interference in light of the associated costs and consequences. If the FCC decides to pursue the reallocation option, it should impose the expenses on the cost-causer, which, at this point, appears to be Nextel alone.

B. Realignment Would Severely Disrupt Incumbent Licensees on the 800 MHz Band

A realignment of the 800 MHz band would have extraordinary consequences for the licensees currently using that band.

⁵² *Nextel White Paper*, *supra* note 5, at 21.

⁵³ *NPRM*, 17 F.C.C. Rcd. 4873 ¶ 27.

1. 800 MHz Users Generally

Realignment would disrupt the operations of Business and I/LT licensees in the 800 MHz band and impose substantial costs. A complete relocation of these incumbent licensees out of the 800 MHz band, as Nextel proposes, would require them to undertake costly, labor-intensive modifications to their systems and purchase new equipment, the availability of which is unclear with regard to the 700 MHz band. A relocation to 900 MHz would likely require the construction of numerous additional sites to account for the different propagation characteristics of that band. Even an in-band relocation, such as those proposed by the NAM and the FCC, would impose significant costs and disruption. Most users would have to modify each of their transmitter sites and recall their vehicular and portable units from the field in order to retune or replace them. This relocation would render potentially billions of dollars worth of equipment useless. Because licensees could not operate their systems at full strength during this transition, the relocation would also disrupt their ongoing business operations.

2. Realignment Would Be Particularly Disruptive to Utilities and their Wireless Systems, Which Should Receive Heightened Protection from the FCC

In comparison to most Business and I/LT licensees, utilities would suffer greatly magnified hardships. The hard-currency financial implications of such a change for a utility with an extensive wide-area system would be extraordinary. Utilities operate extensive systems that track their service territory. Delmarva and Atlantic believe that utilities likely comprise the largest class of Business and I/LT licensees in the 800 MHz band and that their typical operating territories are larger than most other Business and I/LT licensees. Utilities require the construction of a large number of sites and the acquisition and use of large numbers of vehicular and portable units. Furthermore, the internal resources required in terms of utility man-hours and

system downtime are limited and would add considerably to the overall cost of both an out-of-band and an in-band relocation.

In addition to these financial hardships, mandatory relocation would potentially disrupt vital utility operations. As the suppliers of electricity and other energy products and services to the public, utilities have a unique role in the functioning of modern society. Virtually every aspect of modern life depends upon the ability of utilities to carry out their functions in a safe and efficient manner. The FCC is well aware of the vital role that land mobile communications play in utility functions. Congress has also recognized the importance of utility communications:

In managing spectrum, the FCC . . . first should attempt to meet the requirements of those radio users which render important services to large groups of the American public, such as governmental entities and utilities, rather than the requirements of those users which would render benefits to relatively small groups.⁵⁴

More recently, Congress has taken specific steps to protect utilities from the disruption, cost, and uncertainty associated with spectrum auctions. The 1997 Balanced Budget Act amended Section 309(j) of the Communications Act to require the Commission to award mutually exclusive applications for initial licenses or permits using competitive bidding procedures.⁵⁵ Despite this competitive bidding requirement, the Balanced Budget Act included the following exemption:

(2) EXEMPTIONS—The competitive bidding authority granted by this subsection shall not apply to licenses or construction permits issued by the Commission—

(A) for public safety radio services, *including private internal radio services used by State and local governments and non-*

⁵⁴ S. Rep. No. 191, 97th Cong., 2d Sess. (1982), *reprinted in* 1982 U.S.C.C.A.N. 2237, 2250.

⁵⁵ Balanced Budget Act, § 3001, 47 U.S.C. § 309(j).

government entities and including emergency road services provided by not-for-profit organizations, that—

(i) are used to protect the safety of life, health, or property; and

(ii) are not made commercially available to the public;⁵⁶

The House Conference Report to the 1997 Budget Act stated that “the exemption from competitive bidding authority for ‘public safety radio services’ includes ‘private internal radio services’ used by *utilities*, railroads, metropolitan transit systems, pipelines, private ambulances, and volunteer fire departments.”⁵⁷ Thus, Congress clearly recognizes that utilities must have access to spectrum to promote Public Safety.

Utility communications systems are important to national security as well. For example, the 2001 Department of Commerce Appropriations Act required NTIA to report to Congress on the current and future use of spectrum by energy, water, and railroad service providers to protect and maintain the Nation’s critical infrastructure.⁵⁸ In its Report, NTIA concluded that utilities provide essential public services and are vital components of the Nation’s critical infrastructure.⁵⁹ Any “system disruptions that are not quickly restored pose potential threats not only to Public Safety, but also to the Nation’s economic security.”⁶⁰ By way of example, the NTIA Report cautioned that a disruption in a power generating station’s control computer could

⁵⁶ *Id.* § 309(j)(2) (emphasis added).

⁵⁷ House Conf. Rep. No. 105-217, 105th Cong., 1st Sess., at 572 (1997) *reprinted in* 1997 U.S.C.C.A.N. 176, 192.

⁵⁸ Federal Funding, Fiscal Year 2001, Pub. L. No. 106-553, 114 Stat. 2762, 2762A-73 (2000).

⁵⁹ Marshall W. Ross and Jeng F. Mao, Current and Future Spectrum Use by the Energy, Water, and Railroad Industries, Response to Title II of the Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 2001 Pub. L. 106-553, U.S. Department of Commerce, National Telecommunications and Information Administration 3-3 (Jan. 30, 2002).

⁶⁰ *Id.*

be “just as devastating” to the Nation’s economy as the September 11, 2001 terrorist attacks.⁶¹ Furthermore, the President’s Commission on Critical Infrastructure Protection was established because certain critical infrastructures, such as electrical power systems, are “so vital that their incapacity or destruction would have a debilitating impact.”⁶² Our Nation’s “economic prosperity, and quality of life have long depended on the essential services” provided by utilities.⁶³

The need to protect utility communications systems from disruption after the events of September 11th is particularly important. In Afghanistan, the United States discovered that terrorists had diagrams of American nuclear power plants and public water facilities.⁶⁴ Although these diagrams did not reveal any specific plans to attack a utility, the fact that terrorists had this information clearly indicates that utilities are an inviting target. If the unthinkable occurred, large segments of the population could be put at risk and the economy could be devastated.⁶⁵

In light of these factors, the FCC should be particularly circumspect in connection with any measures that could impose unnecessary costs or disruption on utilities’ communications systems.

⁶¹ *Id.*

⁶² Exec. Order No. 13,010, 61 Fed. Reg. 37,347 (July 17, 1996).

⁶³ President’s Commission on Critical Infrastructure Protections, Critical Foundations – Protecting America’s Infrastructures ix (Oct. 1997).

⁶⁴ David Johnston and James Risen, *Seized Afghan Files Show Intent, Not Plans*, N.Y. TIMES, Feb. 1, 2002, at A13.

⁶⁵ A recent column in the *Washington Times* by Robert Charles, counsel and staff director to the U.S. House National Security Subcommittee from 1995 to 1999, discussed the likelihood of utilities being “the next primary terrorist target” and the potential effects of terrorist attacks on utilities. Robert Charles, *Priority Required for Protecting Utilities*, WASHINGTON TIMES, Mar. 4, 2002, at A17.

C. The FCC Should Not Reallocate an Entire Band to Resolve a Problem That is Caused by One Entity

There is no dispute that the interference described in Nextel's *White Paper* is overwhelmingly the result of Nextel's operations. However, Nextel would enjoy unique benefits under its proposal, including access to significant additional, contiguous spectrum. In contrast, the numerous remaining users of the 800 MHz band, who have no demonstrated involvement in the interference to Public Safety operators, would suffer significant hardship. Based on this extraordinary imbalance in the relative impact on the interested parties, the FCC should view Nextel's proposal as a highly suspect "remedy" to the asserted problem.

V. THE REALLOCATION PROPOSALS WOULD CAUSE NEEDLESS DISRUPTION AND EXPENSE

The *NPRM* outlined three 800 MHz realignment proposals: one from Nextel, one from the National Association of Manufacturers ("NAM"), and one from the FCC itself. As explained below, none of these realignment proposals would provide sufficient public benefit to justify the tremendous disruption and expense they would cause.

A. The Nextel Plan is Overly Broad, Complicated, and Expensive

Under the Nextel Plan, the FCC would relocate most of the incumbent licensees in the 800 MHz band, allocating 20 MHz of contiguous spectrum at the lower end of the 800 MHz band for Public Safety licensees, placing Digital SMR systems at the upper portion of the band, and moving Business, I/LT, and analog SMR completely out of the band.⁶⁶ Nextel would relinquish its spectrum in the 700 MHz Guard Band and the 900 MHz band as replacement spectrum for these displaced Business, I/LT, and analog SMR licensees, but Nextel would receive compensation in the form of 10 MHz of 2 GHz spectrum in the current MSS allocation.⁶⁷

⁶⁶ *Nextel White Paper*, *supra* note 5, at 28-30.

⁶⁷ *Id.* at 29.